

REMARKS/ARGUMENTS

Upon entry of this amendment, claim 3 will be canceled without prejudice or disclaimer of the subject matter recited therein and preserving the right to file the canceled subject matter in one or more divisional and/or continuation applications, and claim 1 will be amended. Claim 1 is the sole independent claim.

Claim 1 has been amended herein to be even more in accordance with standard U.S. practice. In particular, Applicants note that the amendments thereto should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed attached thereto.

Moreover, the specification has been amended at page 8 with respect to the discussion of birefringence measurement to change "once $> 90^\circ$: b" to "once $< 90^\circ$: b". This change is being made to evenly more accurately denote the manner in which retardation is determined for determining birefringence in accordance with the use of the disclosed Berek compensator and reference table supplied by the manufacturer. In this regard, Applicants note that the Supplemental Information Disclosure Statement submitted herewith cites commonly assigned U.S. Patent No. 6,511,624 issuing from an application filed on even date with the present application that includes a reference, column 5, to the same Berek compensator for determining retardation and birefringence.

Reconsideration and allowance of the application are respectfully requested.

Response To Formal Matters

Applicants express appreciation for the inclusion with the Office Action of a copy of the initialed Forms PTO-1449, whereby the Examiner's consideration of the Information Disclosure Statement, filed April 2, 2002, is of record.

Applicants also express appreciation for the acknowledgment of the claim of foreign priority as well as receipt of the certified copy of the priority document.

Applicants further note that the drawings filed with the application have not been objected to whereby it is assumed that the drawings as filed with the application are considered to meet formality requirements for drawings, and no further action with respect to the drawings is required by Applicants.

The Abstract of the Disclosure has been amended herein to be in the form of one paragraph. Therefore, the objection to the Abstract of the Disclosure should be withdrawn.

Response To Restriction Requirement

Applicants' election with traverse of Group I in Paper No. 9 is acknowledged in the Office Action. The Office Action considers the requirement to be proper and makes the requirement final.

In response, Applicants have canceled non-elected claim 3 without prejudice or disclaimer of the subject matter recited therein, and preserving the right to include the canceled subject matter in one or more divisional and/or continuation applications.

Response to Art Based Rejections

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rowan et al. (hereinafter “Rowan”), U.S. Patent No. 4,851,172, in view of Japanese Patent Abstract JP707819 (hereinafter “JP ‘819”). In this ground of rejection, the rejection asserts that it would have been obvious to modify the teachings of Rowan by including a third drawing stage wherein the draw ratio is greater than the previous draw ratio motivated by the teachings in the Japanese Abstract to produce a polyester multifilament yarn having a high modulus and low shrinkage.

In contrast to the assertions set forth in the rejection, Applicants respectfully submit that one having ordinary skill in the art would not have been motivated to combine the disclosures of Rowan and JP ‘819. Moreover, even if for the sake of argument the disclosures were combined, Applicants’ disclosed and claimed invention would not be at hand.

For example, Applicants note that independent claim 1 is directed to a process for preparing an industrial polyester multifilament yarn, comprising:

- A) melt-extruding a polyester polymer having ethylene terephthalate units of 90 mol% or more and passing the extruded yarn through a delay quenching zone and then a quenching zone to solidify the yarn to have an intrinsic viscosity of 0.88 or more;
- B) oiling and taking up the undrawn yarn at an appropriate speed with the density of 1.338 to 1.365 g/cm³; and
- C) drawing the yarn at the glass transition temperature or lower in three stages with the proviso that the draw ratio is greater in the 1st stage than in the 2nd stage or the 3rd stage

and greater in the 3rd stage than in the 2nd stage, heat-setting the drawn yarn, relaxing heat-set yarn, and winding the resulting yarn, to obtain an industrial polyester multifilament yarn having a terminal modulus of 35 g/d or less and a tenacity of 7.2 g/d or more.

Moreover, dependent claim 2 further defines Applicants' invention by reciting that the yarn is drawn at a total draw ratio of 1.5 to 2.5.

Thus, the present invention is characterized in that an undrawn yarn (e.g., having a relatively low orientation and crystallinity) and having a density of 1.338 to 1.365 g/cm³ is drawn through three phases such that a first draw ratio is higher than a second draw ratio to produce a high tenacity polyester yarn, having a terminal modulus of 35 g/d or less and a tenacity of 7.2 g/d or more, which is useful for tire cord.

In contrast, Rowan discloses a draw point localizing method using steam at 300°C or higher. Accordingly, Rowan does not teach or suggest, amongst other features, drawing the yarn at the glass transition temperature or lower in three stages with the proviso that the draw ratio is greater in the 1st stage than in the 2nd stage or the 3rd stage and greater in the 3rd stage than in the 2nd stage, heat-setting the drawn yarn, relaxing heat-set yarn, and winding the resulting yarn, to obtain an industrial polyester multifilament yarn having a terminal modulus of 35 g/d or less and a tenacity of 7.2 g/d or more.

Additionally, JP '819 discloses a method of producing a drawn yarn using an undrawn yarn with an intrinsic viscosity of 0.85 or more and a density of 1.365 g/cm³ or more. Accordingly, the high tenacity yarn, having tenacity of 7.2 g/d or more, useful for tire cords according to the present

invention is not obvious in view of Rowan and JP '819 even if for the sake of argument the disclosures of Rowan and JP '819 were combined. For example, the undrawn yarn with the intrinsic viscosity of 0.85 or more and the density of 1.365 g/cm³ or more, as disclosed in JP '819, has relatively high orientation and crystallinity, and thus, it is difficult to mechanically draw the undrawn yarn. Hence, drawn yarn with tenacity of 7.0 or less can be produced, but the high tenacity yarn with tenacity of 7.2 g/d or more cannot be produced according to the method of JP '819.

Moreover, the temperature of a third drawing roller in the example of JP '819 is 225°C. Accordingly, any combination of Rowan and JP '819 would not arrive at Applicants' disclosed and claimed invention which includes the above noted drawing the yarn at the glass transition temperature or lower in three stages with the proviso that the draw ratio is greater in the 1st stage than in the 2nd stage or the 3rd stage and greater in the 3rd stage than in the 2nd stage, heat-setting the drawn yarn, relaxing heat-set yarn, and winding the resulting yarn, to obtain an industrial polyester multifilament yarn having a terminal modulus of 35 g/d or less and a tenacity of 7.2 g/d or more.

Applicants further note that Rowan and JP '819 are cited and discussed in the specification beginning at page 1. In particular, it is pointed out that Rowan discloses a draw point localizing method with the use of steam of 300°C or higher. Moreover, JP '819 is disclosed as not being related to tire cords requiring high strength and as disclosing undrawn yarns being drawn at 100°C or lower through multiple-stages after passing a pre-draw stage. In contrast, as disclosed beginning at page 3 of the present specification and as recited in the claims, the present invention includes drawing the yarn at the glass transition temperature or lower in three stages with the proviso that

the draw ratio is greater in the 1st stage than in the 2nd stage or the 3rd stage and greater in the 3rd stage than in the 2nd stage, heat-setting the drawn yarn, relaxing heat-set yarn, and winding the resulting yarn, to obtain an industrial polyester multifilament yarn having a terminal modulus of 35 g/d or less and a tenacity of 7.2 g/d or more.

In view of the above, the rejection of record is without appropriate basis, and should be withdrawn.

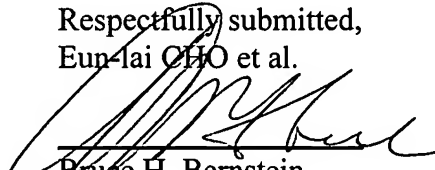
CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejection of record, and allow each of the pending claims.

Applicants therefore respectfully request that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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